ALGEBRA

C – 16

158. If $a^2 + b^2 + c^2 + 27 = 6(a + b + c)$ then what is the value of $\sqrt[3]{a^3 + b^3 - c^3}$?

(A) 3
(B) 1
(C) 9
(D) 6

SSC CGL 2018

$a = \frac{3}{1} = 3$

$b = \frac{3}{1} = 3$

$c = \frac{3}{1} = 3$

$\sqrt[3]{27}$

$= (27)^{\frac{1}{3}}$

$= (3^3)^{\frac{1}{3}} = 3$

$$(a+b+c)^2 = a^2+b^2+c^2+2(ab+bc+ca)$$

(*) $$(a+b-c)^2 = a^2+b^2+c^2+2(ab-bc-ca)$$

(*) $$(a-b+c)^2 = a^2+b^2+c^2+2(-ab-bc+ca)$$

$$(a-b-c)^2 = a^2+b^2+c^2+2(-ab+bc-ca)$$

159. If $ab + bc + ca = 8$ and $a + b + c = 12$ then $(a^2 + b^2 + c^2)$ is equal to

(A) 160
(B) 128
(C) 134
(D) 144

SSC CPO 2018

$$(a+b+c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$$

$$\Rightarrow 144 = K + 2(8)$$

$$\Rightarrow K = 144 - 16 = 128$$

159. If $ab + bc + ca = 8$ and $a + b + c = 12$ then $(a^2 + b^2 + c^2)$ is equal to

(A) 160
(B) 128
(C) 134
(D) 144

SSC CPO 2018

$ab = 8$ / $a + b = 12$

$a^2 + b^2 = ?$

$a^2 + b^2 = ?$

$= (a+b)^2 - 2ab$

$= 144 - 2 \times 8$

$= 144$
$- 16$

8

160. *If* $(a+b+c) = 16$, *and* $(a^2+b^2+c^2) = 90$, *find the value of* $(ab+bc+ca)$.

(A) 84

(B) 83

(C) 82

(D) 81

SSC CGL 2023

$(16)^2 = 90 + 2(ab+bc+ca)$

$\Rightarrow 256 - 90 = 2K$

$\Rightarrow 166 = 2K$

$K = 83$ Ans

160. If $(a+b+c) = 16$, and $(a^2+b^2+c^2) = 90$, find the value of $(ab+bc+ca)$.

(A) 84

(B) 83

(C) 82

(D) 81

SSC CGL 2023

$b+c=16$

$bc=?$

$b^2+c^2=90$

$(b+c)^2-2bc=90$

$\Rightarrow 256-2bc=90$

$\Rightarrow -2bc=-166$

161. If $(x + y + z) = 23$ and $x^2 + y^2 + z^2 = 179$ then find the value of $(xy + yz + zx)$

(A) 225　　(B) 280

(C) 175　　(D) 350

SSC Phase-XII 2024 (shift-04)

$x^2 + z^2 = 179$

$\Rightarrow (x+z)^2 - 2xz = 179$

$\Rightarrow 529 - 2xz = 179$

$-2xz = -350$

$xz = 175$

$529 - 179 = 350$

$x + z = 23$

$zx = ?$

162. If $a + b - c = 5$ *and* $ab - bc - ac = 10$, then find the value of $a^2 + b^2 + c^2$.

(A) 40

(B) 5

(C) 45

(D) 15

SSC CGL 2021

$a + b = 5$

$ab = 10$

$a^2 + b^2$

$= (5)^2 - 20 = 5$

162. If $a + b - c = 5$ and $ab - bc - ac = 10$, then find the value of $a^2 + b^2 + c^2$.

(A) 40 (B) 5

(C) 45 (D) 15

SSC CGL 2021

$(a+b-c)^2 = a^2+b^2+c^2+2(ab-bc-ca)$

$\Rightarrow 25 = K + 2 \times 10$

$K = 5$

163. If $a + b - c = 12$ and $a^2 + b^2 + c^2 = 110$, then which among the following relations is true?

(p) $ab + bc + ca = 34$
(q) $ab + bc - ca = 17$
(r) $ab - bc + ca = 17$
(s) $ab - bc - ca = 17$

(A) (r)
(B) (q)
(C) (p)
(D) (s)

SSC CHSL 2018

$(a+b-c)^2 = a^2+b^2+c^2+2(ab-bc-ca)$

$144 = 110 + 2(ab-bc-ca)$

$\Rightarrow 34 = 2(ab-bc-ca)$, $17 = ab-bc-ca$

$a^2 + b^2 = 576$ / $ab = 50$

$a + b = ?$

$\Rightarrow (a+b)^2 - 100 = 576$

$\Rightarrow (a+b)^2 = 676$

$\Rightarrow \quad = \pm\sqrt{676}$

$= \pm 26$

164. If $a^2 + b^2 + c^2 = 576$ *and* (ab + bc + ca)=50 , then what is the value of (a + b + c) , if (a + b + c) < 0 ?

(A) 26

(B) −24

(C) −26

(D) 24

SSC CHSL 2020

165. If $x + y + z = 5, x^2 + y^2 + z^2 = 21$ and $y^2 = zx$, then the value of y is:

(A) $\frac{1}{5}$

(B) $\frac{1}{4}$

(C) $\frac{1}{2}$

(D) $\frac{2}{5}$

SSC MTS 2020

$(5)^2 = 21 + 2(xy + yz + zx)$

$\Rightarrow 4 = 2(xy + yz + y^2)$

$\Rightarrow 4 = 2y(x + y + z)$

$\Rightarrow 4 = 2y(5)$

$y = \frac{2}{5}$

166. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, $x > z > 0$), what is the value of $(x - z)$?

(A) -2

(B) 5

(C) 0

(D) -5

SSC CPO 2020

$(19)^2 = 133 + 2(xy + yz + zx)$

$\Rightarrow 361 = 133 + 2(xy + yz + y^2)$

$\Rightarrow 228 = 2 \times y(x + y + z)$

$\Rightarrow 228 = 2 \times y \times 19$

$y = 6$

$y^2 = 36$

$x + z = 13$

169
144
25

$x - z = \sqrt{(13)^2 - 4 \times xz}$

$= \sqrt{169 - 4 \times 36}$

$= \pm 5$

166. If $x + y + z = 19$, $x^2 + y^2 + z^2 = 133$ and $xz = y^2$, $x > z > 0$), what is the value of $(x - z)$?

(A) -2

(B) 5

(C) 0

(D) -5

SSC CPO 2020

$x = 9$ $z = 4$

$y = 6$

$9 - 4 = 5$

167. If $x + y + z = 19, x^2 + y^2 + z^2 = 133$ and $xz = y^2$ *then the difference between z and x is*:

(A) 5
(B) 3
(C) 6
(D) 4

SSC CGL 2018